

DOCUMENTED CHROMOSOME NUMBERS 2005: 3. CHROMOSOME NUMBERS IN NORTH AMERICAN SPECIES OF SILENE AND STELLARIA (CARYOPHYLLACEAE)

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ABSTRACT

Chromosome numbers are reported for 44 collections of *Silene* and 74 collections of *Stellaria* (Caryophyllaceae) from continental North America. First published reports include those for *Silene drummondii* Hook. subsp. *striata* (Rydberg) J.K. Morton 2n = 72, *S. hitchcirei* Bocquet 2n = 24, *S. uralensis* (Rupr.) Bocquet subsp. *ogilviensis* (A.E. Porsild) D.F. Brunton 2n = 48, *Stellaria fontinalis* (Short & Peter) B.L. Robinson 2n = 26, *S. nitens* Nuttall 2n = 20 & 40 and *S. parva* Pederson 2n = 34.

First published reports for material of North American origin include *Silene dichotoma* Ehrhart 2n = 24, *S. dioica* (L.) Clairville 2n = 24, *S. flos-cuculi* (L.) Clairville 2n = 24, *Stellaria alsine* Grimm 2n = 24, *S. cuspidata* Willd. ex Schleidl. subsp. *prostrata* J.K. Morton 2n = 26, *S. neglecta* Weihe 2n = 20 & 22 and *S. palustris* Retz. 2n = ca. 198.

RESUMEN

Se publican los números cromosomáticos de 44 colecciones de *Silene* y 74 colecciones de *Stellaria* (Caryophyllaceae) de Norteamérica continental. Entre los primeros recuentos publicados se encuentran los de *Silene drummondii* Hook. subsp. *striata* (Rydberg) J.K. Morton 2n = 72, *S. hitchcirei* Bocquet 2n = 24, *S. uralensis* (Rupr.) Bocquet subsp. *ogilviensis* (A.E. Porsild) D.F. Brunton 2n = 48, *Stellaria fontinalis* (Short & Peter) B.L. Robinson 2n = 26, *S. nitens* Nuttall 2n = 20 & 40 y *S. parva* Pederson 2n = 34.

Los primeros recuentos en material originario de Norteamérica son *Silene dichotoma* Ehrhart 2n = 24, *S. dioica* (L.) Clairville 2n = 24, *S. flos-cuculi* (L.) Clairville 2n = 24, *Stellaria alsine* Grimm 2n = 24, *S. cuspidata* Willd. ex Schleidl. subsp. *prostrata* J.K. Morton 2n = 26, *S. neglecta* Weihe 2n = 20 & 22 y *S. palustris* Retz. 2n = ca. 198.

INTRODUCTION

The purpose of this paper is to put on record previously unpublished data on chromosome numbers in the species of *Silene* and *Stellaria*, both native and introduced, occurring in continental North America.

METHODS AND MATERIALS

The methods used in obtaining these chromosome counts are described in Morton 2002. Voucher specimens are retained in the author's research collections and partial sets of duplicates have been distributed to WAT, MICH, DAO and VDB. Collection numbers prefixed with NA are J.K. Morton or J.K. Morton and Joan M. Venn collections.

DISCUSSION

Many of these chromosome counts confirm those from previous workers. However, the following appear to be the first published accounts for their respective taxa:- *Silene drummondii* subsp. *striata* $2n = 72$, *S. hitchquirci* $2n = 24$, *S. uralensis* subsp. *ogilviensis* $2n = 48$, *Stellaria fontinalis* $2n = 26$, *S. nitens* $2n = 20$ & 40 and *S. parva* $2n = 34$.

The following chromosome counts appear to be the first published counts for North American material of these taxa:- *Silene dichotoma* $2n = 24$, *S. dioica* $2n = 24$, *S. flos-cuculi* $2n = 24$, *Stellaria alsine* $2n = 24$, *S. cuspidata* subsp. *prostrata* $2n = 26$, *S. neglecta* $2n = 20$ & 22 and *S. palustris* $2n = \text{ca. } 198$.

Polyplody is prevalent in the genus *Silene*, both within single species and between closely related taxa. Examples from the current study include *Silene ostenfeldii* with $2n = 24$, 48 & 72 ; *S. drummondii* subsp. *drummondii* with $2n = 24$ (Cronquist 1991) & 48 , and subsp. *striata* with $2n = 72$; *S. menziesii* with $2n = 24$ & 48 and the closely allied *S. williamsii* with $2n = 48$; *S. repens* with $2n = 24$ & 48 ; *S. uralensis* subsp. *uralensis* with $2n = 24$ (Packer & McPherson 1974), subsp. *ogilviensis* $2n = 48$ and subsp. *porsildii* $2n = 48$ (Knaben 1968).

Stellaria graminea has diploid ($2n = 26$) and tetraploid ($2n = 52$) cytotypes in Europe where it is a native species. All the populations that have been examined from North America, where it is an aggressive introduced rhizomatous weed, are tetraploid with the exception of a sterile triploid ($2n = 39$) colony in Newfoundland. Only the diploid cytotype is known to occur in the British Isles (Blackburn & Morton 1957; Stace 1997). Its absence from North America is surprising in view of the close links between Britain, Newfoundland and the New England states.

The chromosome counts for the broad-leaved form of *Stellaria borealis* are the first reports for this variant. These counts are for plants referable to subspecies *sitchana*. The name var. *latifolia* cannot correctly be applied to these plants because it was originally given to a similar broad-leaved form of *S. borealis* subsp. *borealis* as *S. calycantha* var. *latifolia* B. Boivin (1951). The broad-leaved forms of subsp. *sitchana* retain their characters under cultivation. It appears that this variant is associated with rivers and streams at mid elevations (1200–2100 m) on the forested slopes of the Sierra Nevada Mountains of California.

ACKNOWLEDGMENTS

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TABLE 1. Chromosome numbers in *Silene*.

Taxon	Locality & collection number	Chromosome No. (2n)
<i>S. acaulis</i> (L.) Jacq.	AB: Kananaskis, Highwood Pass, <i>Morton s.n.</i>	24
<i>S. antirrhina</i> L.	AZ: Yavapai Co.: Rimrock, Phoenix to Flagstaff rd., <i>Morton s.n.</i> BC: Okanagan, Hedley, <i>Morton s.n.</i> MB: Whiteshell Prov. Pk., NA3733. ON: Essex Co.: Point Pelee, <i>Morton s.n.</i>	24
<i>S. caroliniana</i> Walter subsp. <i>wherryi</i> (Small) P.T.Clausen	KY: Anderson Co.: US-62, W of Lexington, nr. Tyrone Bridge, NA6857	48
<i>S. coronaria</i> (L.) Clairville	BC: Vancouver Is., Hwy 1, 10 km N of Duncan, NA13582. ON: Waterloo region-Waterloo, <i>McClintock s.n.</i>	24
<i>S. cserii</i> Baumg.	ON: Waterloo Region, Waterloo, NA5579. SK: Estevan Alex s.n.	24
<i>S. dichotoma</i> Ehrhart	ON: Lambton Co.: Pinery Prov. Pk. <i>Calvert s.n.</i> . VA: Floyd Co.: Blue Ridge Pkwy., ml 168 at Saddle Overlook, NA6551	24
<i>S. dioica</i> (L.) Clairville	BC: Vancouver, Stanley Park, NA13499	24
<i>S. douglasii</i> Hook. var. <i>douglasii</i>	OR: Deschutes Co.: <i>Halsey 4669</i>	48
<i>S. drummondii</i> Hook. subsp. <i>drummondii</i> For.	SK: Cypress Hills, NA3870 &, NA13296. UT: Summit Co.: Wasatch Natl. along Hayden Fork, NA7282	48
<i>S. drummondii</i> Hook. subsp. <i>striata</i> (Rydberg) J.K.Morton	CO: Larimer Co.: Hwy. 34 in Rocky Mnt. Natl. Pk., <i>Morton s.n.</i>	72
<i>S. flos-cuculi</i> (L.) Clairville	NS: Kings Co.: Annapolis Vall., Aylesford, NA5447. NY: I-81 between Binghampton & Syracuse, NA3581	24
<i>S. gallica</i> L.	BC: Vancouver Is., Victoria, Uplands Pk., NA13551. TX: Brazos Co.: Hensel Pk., Fryxell 1270	24
<i>S. hitchcirei</i> Bocquet	CO: Clear Creek Co.: Mnt. Evans, NA7375	24
<i>S. involucrata</i> (Cham. & Schlecht.) Bocquet subsp. <i>involucrata</i>	NT: Tuktoyaktuk Gillett 18719. YT: Dawson, <i>Morton s.n.</i>	48
<i>S. involucrata</i> (Cham. & Schlecht.) Bocquet subsp. <i>tenella</i> (Tolm.) Bocquet	NT: Dempster Hwy., Campbell L., S of Inuvik, NA13830. YT: Dempster Hwy., km 141, Ogilvie Mnts., NA14010	48
<i>S. latifolia</i> Poir.	AB: Fort Saskatchewan, NA3893	24
<i>S. menziesii</i> Hook.	AB: Coleman to Kananaskis rd., Livingstone Falls, NA4656. BC: Cache Creek, NA3406. Mannings Prov. Pk., NA13511. Princeton, NA13506	48
<i>S. noctiflora</i> L.	YT: Alaska Hwy., NW of Haines Jct., NA2060	24
<i>S. ostenfeldii</i> (A.E. Porsild) J.K. Morton	ON: Wellington Co.: Luther Lake, NA4950 AK: Taylor Hwy. near Chicken, NA2131 NT: Heart Lake, nr. Hay River, <i>Packer 168</i> . NT: Banks Is. Kuc, CAN 330826. YT: Klondike Hwy. at Moose Creek, SE of Dawson, NA2180	24 24 48 72

TABLE 1. continued

Taxon	Locality & collection number	Chromosome No. (2n)
<i>S. parryi</i> (S.Watson) Hitchcock & Maguire	WA: Pierce Co.: Mnt. Rainier, Morton s.n.	48
<i>S. repens</i> Patron	AK: Taylor Hwy. near Chicken, NA2128. YT: Dawson, Dome Mnt., NA13751	24
	YT: Dempster Hwy. N of Engineer Creek, Ogilvie Mnts., NA13936	48
<i>S. uralensis</i> (Rupr.) Bocquet subsp. <i>ogilviensis</i> (A.E. Porsild) D.F.Brunton	AK: Kotzebue, Packer 3473	48
<i>S. virginica</i> L.	NC: Rutherford Co.: Lake Lure, NA4431	48
<i>S. williamsii</i> Britton	AK: Taylor Hwy. near Chicken, NA2127	24

TABLE 2. Chromosome numbers in *Stellaria*.

Taxon	Locality & collection number	Chromosome No. (2n)
<i>S. alsine</i> Grimm	NF: St. George's Dist.: St. Andrews, NW of Port aux Basques., NA12112. NS: Cape Breton Co.: between Sydney & North Sydney, NA5164	24
<i>S. borealis</i> Bigelow subsp. <i>sitchensis</i> (Steudel) Piper	BC: Vancouver Is.: Malahat Dist., Shawnigan Lake, NA17204	ca. 52
	BC: Vancouver Is.: Alberni Dist., Cameron R., W of Cathedral Grove, NA8365. WA: Pierce Co.: lower slopes Mt. Rainier, E side, NA3325	52
broad-leaved form (var. " <i>latifolia</i> ")	BC: New Westminster Dist.: Garibaldi, N of Vancouver, NA3355	<i>n</i> = 26
	CA: Elderado Co.: W side Lake Tahoe, NA17398. Mariposa Co.: Yosemite Natl. Pk., NA17405. Plumas Co.: CA-89, between Clio & Sierra Co. line, NA17395. Sierra Co.: Tahoe Natl. For. at Sulphur Ck. crossing, NA17396	52
<i>S. crassifolia</i> Ehrhart	AB: Cypress Hills Prov. Pk., NA3825. Lac St. Anne, rte. 43, W of Edmonton, NA1902. YT: S end Dempster Hwy. nr. Dawson, NA2166	26
<i>S. cuspidata</i> Willd. ex Schltdl. subsp. <i>prostrata</i> (Baldwin) J.K.Morton	TX: Hidalgo Co.: S of Mission, Morton s.n.. Atascosa Co.: nr. Jourdanton, NA19111. Live Oak Co.: FM-99 at Atascosa R. crossing, NA19124	26
<i>S. fontinalis</i> (Short & Peter) B.L.Robinson	TN: Nashville Morton s.n.	26
<i>S. graminea</i> L.	BC: Vancouver - Pitt Meadows, NA13504. NB: York Co.: Fredericton, NA4210. NF: St. Barbe South Dist.: Bonne Bay, NA5320. St. John's, NA5238. White Bay North Dist.: St. Anthony (Northern Peninsula) Morton s.n.	52

TABLE 2. continued

Taxon	Locality & collection number	Chromosome No. (2n)
	NS: Halifax Co.: Halifax <i>Morton</i> s.n., Victoria Co.: Cape Breton Is., Ingonish <i>Morton</i> s.n., Cape Breton Co.: Cape Breton Is., Glace Bay, NA4261. ON: Bruce Co.: Dyer Bay to Cabot Head, NA2770. Sudbury Dist.: Massey <i>Morton</i> s.n. Muskoka Dist.: Gravenhurst <i>Morton</i> s.n. Manitoulin Dist.: Manitoulin Is. Morton s.n. PE: Kings Co.: Panmure Head Shchepanek & Dugal 382; <i>Shchepanek & Dugal</i> 3664. Kings Co.: Montague <i>Shchepanek & Dugal</i> 3664. PQ: Cité de Kamouraska: Saint-Denis, NA2901. Cité de Gatineau: Masham <i>Morton</i> s.n. Cité de Rouville: Rougemont <i>Morton</i> s.n. Cité de Charlevoix: Baie-Sainte-Catherine, NA15254. Cité de Verchères: Verchères (Montreal), NA4982. Cité de Gaspé-Ouest: Sainte-Anne-des-Monts, NA2969. Cité de Gaspé-Est: Douglastown, NA3020. Cité de Matane: slopes of Mont Logan, NA4023. ME: Acadia Natl. Pk.: Seal Cove, NA5149. Penobscot Co.: Newport, NA5134. Somerset Co.: Mercer, NA5132. Mi: St. Clair Co.: Port Huron <i>Morton</i> s.n. NC: Jackson Co.: Cherokee <i>Morton</i> s.n. PA: Chester Co.: Octoraro Ck. below Lees Bridge (Nottingham), NA3568. NF: St. Barbe South Dist.: Hawke's Bay (Northern Peninsula), NA12347.	39
<i>S. humifusa</i> Rattb.	NF: St. George's Dist.: St. George's nr. Stephenville, NA5187. St. Barbe North Dist.: New Ferolle (Northern Peninsula), NA12329.	26
<i>S. longipes</i> Goldie subsp. <i>longipes</i>	CA: Shasta Co.: Lessen Volcanic Natl. Pk., NA17378. Plumas Co.: CA-89 at Sulphur Ck., NA17392. UT: Summit Co.: Wasatch Natl. For. Along Hayden Fork, NA7277. CO: Clear Creek Co.: slopes of Mt. Evans, NA7353. Rocky Mnt. Natl. Pk.: US-36 above Estes Park, NA7332. NT: Dempster Hwy. in Richardson Mnts. ca. 50 km S of Peel R. crossing, NA13852. WY: Albany Co.: Laramie, Snowy Range Pass, NA7294.	52
<i>S. media</i> (L.) Vill.	CA: Mendocino Co.: Fort Bragg, NA15796. ON: Essex Co.: Point Pelee, NA3534. Essex Co.: Pelee Is., Fish Pt., NA3604. ON: Waterloo Reg. Mun.: Waterloo, NA19383.	104
<i>S. neglecta</i> Weihe	KY: Boone Co.: US-42, SW of Hume, NA7799. KY: Grant Co.: Corinth, NA19612.	40
<i>S. nitens</i> Nutt.	BC: Vancouver Is.: Cowichan Lake Dist., Skutz Falls (W of Duncan), <i>Morton</i> s.n. AZ: Gila Co.: AZ-188 between Punkin Center & Roosevelt, NA11379.	22
		20

TABLE 2. continued

Taxon	Locality & collection number	Chromosome No. (2n)
<i>S. pallida</i> (Dum.) Crépin	AZ: Graham Co.: Aravaipa Canyon, NA18504. KY: Boone Co.: I-75, S of Cincinnati, NA7797. NC: Carteret Co.: Beaufort, NA5646b. ON: Elgin Co.: Hwy. 401 between Dutton & West Lorne, NA19390a	22
<i>S. palustris</i> Retz.	PQ: Cité de Verchères: Verchères (Montreal), NA4981 & NA5452	ca. 198
<i>S. parva</i> Pederson	LA: Acadia Parish: Crowley, NA18461	34
<i>S. porsildii</i> Chinnappa	AZ: Greenlee Co.: Mt. Baldy, NA7058. NM: San Miguel Co.: slopes of Santa Fe Baldy, NA7116	26
<i>S. umbellata</i> Turcz.	CO: Clear Creek Co.: Mt. Evans, NA7373. WY: Park Co.: Beartooth Pass, NA4808. YT: Dawson, at start of Dempster Hwy., NA2170	26

REFERENCES

- BLACKBURN, K.B. and J.K. MORTON. 1957. The incidence of polyploidy in the Caryophyllaceae of Britain and Portugal. *New Phytol.* 56:344–351.
- BOIVIN, B. 1951. Centurie de plantes Canadiennes. II. *Canad. Field-Naturalist* 65:7.
- GLEASON, H.A. and A. CRONQUIST. 1991. Manual of vascular plants of northeastern United States and adjacent Canada. ed. 2. New York.
- KNABEN, G. 1968. Chromosome numbers of flowering plants from central Alaska. *Nytt Mag. Bot.* 15:240–254.
- MORTON, J.K. 2002. Documented chromosome numbers 2002:2. Chromosome numbers in North American species of *Cerastium* (Caryophyllaceae). *Sida* 20:1:227–231.
- PACKER, J.G. and G.D. MCPHERSON. 1974. Chromosome numbers in some vascular plants from northern Alaska. *Canad. J. Bot.* 52:1095–1099.
- STACE, C. 1997. New flora of the British Isles. ed. 2. Cambridge Univ. Press.